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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In Re the Application of

Group Art Unit: 2837

DONNELLY et al

Examiner:

Serial No.: 10/649,286

Filed: August 26, 2003

Atty. File No.: 5107-3-CIP

For: "METHOD FOR MONITORING AND  
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INFORMATION DISCLOSURE STATEMENT

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Dear Sir:

The references cited on attached Form PTO-1449 are being called to the attention of the Examiner.

☒ Copies of the cited non-patent, non-published patent application, and/or foreign references are enclosed herewith☒ Copies of the cited U.S. patents/patent application publications are not enclosed in accordance with the waiver dated July 11, 2003, whereby patent applications filed after June 30, 2003 and international applications that have entered the national stage under 35 U.S.C. § 371 after June 30, 2003 need not submit copies of U.S. patents and U.S. patent application publications.☐ Copies of the cited references are not enclosed, in accordance with 37 C.F.R. 1.98(d), because the references were cited by or submitted to the U.S. Patent and Trademark Office in prior application Serial No. \_\_\_\_\_ filed \_\_\_\_\_, which is relied upon for an earlier filing date under 35 U.S.C. § 120.☐ To the best of applicants' belief, the pertinence of the foreign-language references are believed to be summarized in the attached English abstracts and in the figures, although applicants do not necessarily vouch for the accuracy of the translation.☐ Examiner's attention is drawn to the following co-pending applications, copies of which have been or are being submitted:

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It is respectfully requested that the cited information be expressly considered during the prosecution of this application and the references made of record therein.

### FEES

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☐ Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. 37 C.F.R. 1.97(c)(1).

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Respectfully submitted,

SHERIDAN ROSS P.C.

By: 

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Date: Nov. 2, 2004

Substitute for form 1449A/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>				<b>Complete if Known</b>	
				Application Number	10/649,286
				Filing Date	August 26, 2003
				First Named Inventor	Frank Wegner Donnelly
				Art Unit	2837
				Examiner Name	
Sheet	1	of	1	Attorney Docket Number	5107-3-CIP

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Document Number Number-kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	US-5,564,795	10-15-1996	Engle	

FOREIGN PATENT DOCUMENTS							
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OTHER ART (Including Author, Title, Date, Pertinent Pages, etc.)		
Examiner Initials*	Cite No. <sup>1</sup>	
	2.	Band, C.E. et al., "Development of and Operational Experience with a High Powered D.C. Chopper for 1500 Volt D.C. Railway Equipment," Institution of Electrical Engineers Conference Publication 53 on Power Thyristors and Their Applications, Part 1 (May 1969), pp. 277-288.

Examiner Signature		Date Considered	
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\*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

## Development of and Operational Experience with a High Powered D.C. Chopper for 1500 Volt D.C. Railway Equipment

C.E. Band and J.H. Stephens

**Introduction.** In order to progress beyond the 600/1000 Volt D.C. traction systems, for which chopper techniques were established, a 1500 volt equipment was built in 1967 and has been in regular service since July 1968. The equipment was based on operational experience obtained with 600 volt chopper on London Transport Board's fourth rail system, and was supplied to N.R. for installation in one of their motor coaches.

**Power Circuits.** The power circuit is arranged to have a separate chopper network for each permanently coupled series pairs of motors, with the two networks linked to the 1,000 volt overhead supply via a common filter choke and capacitor (Fig. 1). The traction system experiences transient voltages of up to 6kV, which are reduced to a more acceptable level by means of a spark gap/metrosil network set to spark over at 3700 volt D.C. This enables the following power networks to be employed:-

- T1 - 2 parallel strings, each string 6 series 800 volt inverter grade thyristors
- T2 - 1 parallel string, each string 4 series 1100 volt limited turn off thyristors
- D1 - 2 parallel strings, each string 2 series 2200 volt diodes
- D2 - 1 parallel string, each string 3 series 2200 volt diodes
- D3 - 2 parallel strings, each string 4 series 2200 volt diodes

Each device is mounted on a separate heat sink and natural cooling is used throughout.

In order to reduce the size of the filter capacitor and to double the frequency of the line ripple current, the chopper networks are arranged to pulse alternately, each one covering the range 100 Hz to 400 Hz. During motoring cut-out conditions, the minimum frequency is raised to 130 Hz in order to keep the ripple frequency well above the safety signaling frequencies of 50 Hz and 75 Hz.

Band and Stephens are with A.E.I. Traction, Ltd.

Institution of Electrical Engineers Conference Publication 53 on Power Thyristors and Their Applications, Part 1, pp. 277-288, May 1969

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